Prevention of Cold-Related Illness

When winter temperatures drop significantly below normal, staying warm and safe can become a challenge. During the past ten winters, 135 Missourians died from cold-related illness. A little over half of these individuals were age 65 and over. During the winter of 1996–97, 14 deaths due to cold-related causes were reported; seven of those deaths were in individuals age 65 and over.

An individual gains body heat from food and muscular work, and loses it through convection, conduction, radiation and sweating to maintain a constant body temperature of approximately 98.6°F. The body's first response to a cold environment is constriction of the blood vessels of the skin; that reduces heat loss from the surface of the skin by decreasing peripheral blood flow; and/or shivering, that generates heat by increasing the body's metabolic rate.

Older adults often make less body heat because of a slower metabolism and less physical activity. They are often homebound and bedfast, and have less perception of the cold. Frequently, they are trying to reduce expenditures on heating and may gradually get so cold that their body temperature falls below a critical level, and even at temperatures well above the freezing mark, persons may die of hypothermia. If you are more than 65 years of age, check the temperature in your home often, especially during severely cold weather. All Missourians should check on elderly friends and neighbors frequently to ensure that their homes are adequately heated.

Infants less than one year old should never sleep in a cold room because infants lose body heat more easily than adults; and unlike adults, infants are not able to make additional body heat by shivering. Provide warm clothing and a blanket for infants and try to maintain a warm indoor temperature. If the temperature cannot be maintained, make temporary arrangements to stay elsewhere. In an emergency, you can keep an infant warm using your own body heat. If you must sleep, take precautions to prevent rolling on the baby. Pillows and other soft bedding can also present a risk of smothering;remove them from the area near the infant.

Exposure to cold temperatures, whether indoors or outdoors, can cause serious or life-threatening health problems. The most common cold-related problems are hypothermia and frostbite.

Hypothermia

When exposed to cold temperatures, your body begins to lose heat faster than it can be produced. Prolonged exposure to cold will eventually use up the body's stored energy. The result is hypothermia, or abnormally low body temperature. Body temperature that is too low affects the brain, making the victim unable to think clearly or move well. This makes hypothermia particularly dangerous because a person may not know it is happening and will not be able to do anything about it.

Hypothermia is most likely to occur at very cold temperatures, but can occur even at cool temperatures (above 40°F) if a person becomes chilled from rain, sweat or submersion in cold water.

Victims of hypothermia are most often:

- elderly people with inadequate food, clothing, or heating;
- babies sleeping in cold bedrooms;
- people who remain outdoors for long periods–the homeless, hikers, hunters, etc.

Warnings signs of hypothermia:

Adults	Infants
shivering	bright red, cold skin
confusion	very low energy
memory loss	
drowsiness	
exhaustion	
fumbling hands	
slurred speech	

What to Do

If you notice any of these signs, take the person's temperature. If it is below 95°F, the situation is an emergency–get medical attention immediately.

If medical care is not available immediately, begin warming the person, as follows:

- Get the victim into a warm room or shelter.
- If the victim has on any wet clothing, remove it.
- Warm the center of the body first—chest, neck, head, and groin—using an electric blanket, if available. Or use skin-to-skin contact under loose, dry layers of blankets, clothing, towels or sheets.
- Warm beverages can help increase the body temperature, but do not give alcoholic beverages. Do not try to give beverages to an unconscious person.
- After body temperature has increased, keep the person dry and wrapped in a warm blanket, including the head and neck.
- Get medical attention as soon as possible.

A person with severe hypothermia may be unconscious and may not seem to have a pulse or to be breathing. In this case, handle the victim gently, and get emergency assistance immediately. Even if the victim appears dead, CPR should be provided. CPR should continue while the victim is being warmed, until the victim responds or medical aid becomes available. In some cases, hypothermia victims who appear to be dead have been successfully resuscitated.

Frostbite

Frostbite is an injury to the body that is caused by actual freezing of skin and sometimes underlying body tissues. Frostbite causes a loss of feeling and color in affected areas. It most often affects the nose,ears, cheeks, chin, fingers

or toes. Frostbite can permanently damage the body, and severe cases can lead to amputation. The risk of frostbite is increased in people with reduced blood circulation and among people who are not dressed properly for extremely cold temperatures.

Recognizing Frostbite

At the first signs of redness or pain in any skin area, get out of the cold or protect any exposed skin—frostbite may be beginning. Any of the following signs may indicate frostbite:

- discoloration of the skin
- skin that feels unusually firm or waxy
- numbness

A victim is often unaware of frostbite until someone else points it out because the frozen tissues are numb.

What to Do

If you detect symptoms of frostbite, seek medical care. Because frostbite and hypothermia both result from exposure, first determine whether the victim also shows signs of hypothermia, as described previously. Hypothermia is a more serious medical condition and requires emergency medical assistance.

If there is frostbite but no sign of hypothermia and immediate medical care is not available, proceed as follows:

- Get into a warm room as soon as possible.
- Unless absolutely necessary, do not walk on frostbitten feet or toes—to do so increases the damage.
- Immerse the affected area in warm—not hot—water (the temperature should be comfortable to the touch for unaffected parts of the body).
- Or, warm the affected area using body heat. For example, the heat of an armpit can be used to warm frostbitten fingers.
- Do not rub the frostbitten area with snow or massage it at all—to do so will cause more damage.
- Don't use a heating pad, heat lamp or the heat of a stove, fireplace or radiator for warming. Affected areas are numb and can be easily burned.

These procedures are not substitutes for proper medical care. Hypothermia is a medical emergency and frostbite should be evaluated by a health care provider. It is a good idea to take a first aid and emergency resuscitation (CPR) course to prepare for cold-weather health problems. Knowing what to do is an important part of protecting your health and the health of others.

Major Risk Factors for Cold-Related Illness

In addition to the cold environment, other major risk factors contributing to cold-related illness include:

- Inadequate clothing or wet clothing (the actual effects of cold on the body depend on how well the skin is insulated from the environment);
- Drug use or certain medications may inhibit the body's response to cold or impair judgment (examples include beta blocks, neuroleptic drugs, alcohol and cigarettes);
- Diseases or conditions that limit activity, reduce awareness or reduce the normal flow of blood, such as a cold, diabetes, atherosclerosis, hypothyroidism, stroke, severe arthritis, Parkinson's disease or memory disorders, may increase risk;
- Gender: male death rates due to cold exposure are greater than the rates for females; perhaps because of inherent risk-taking activities, body fat composition, or other physiological differences;
- Susceptibility increases with age;
- Exhaustion or immobilization, especially through injury or entrapment.

Environmental Conditions

Environmental conditions that cause cold-related stresses are low temperature, cool high winds, dampness, and cold water. Wind chill (temperature and wind velocity) is an important factor to evaluate when working outside. For example, when the actual air temperature of the wind is 40°F and its velocity is 35 mph, the exposed skin would perceive these conditions as if the equivalent still air temperature were 11°F. A dangerous situation of rapid heat loss may arise for any individual exposed to high winds and cold temperatures.

Eat and Drink Wisely

Eating well-balanced meals will help you stay warmer. Do not drink alcoholic beverages—they cause your body to lose heat more rapidly. Instead, drink warm, sweet beverages such as hot chocolate or sweetened coffee or tea to help maintain your body temperature. If you have any dietary restrictions, ask your doctor.

Avoid Exertion

Cold weather puts an extra strain on the heart. If you have heart disease or high blood pressure, follow your doctor's advice about shoveling snow or performing other hard work in the cold. Otherwise, if you have to do heavy outdoor chores, dress warmly and work slowly. Remember, your body is already working hard just to stay warm, so don't overdo it.

Taking preventive action is the best defense against having to deal with extreme cold-weather conditions. By observing safety precautions during times of extremely cold weather, the risk of cold-related health problems will be reduced.

Additional information on cold-related illness can be found on the Department of Health homepage at http://www.health.state.mo.us/cgi-bin/uncgi/PreventionandWellness.

SOURCES:

Extreme Heat/Extreme Cold A Prevention Guide to Promote Your Personal Health and Safety, Centers for Disease Control and Prevention, 1996.

Preventing Cold-Related Illnesses in Agricultural Workers, Rutgers Cooperative Extension, Rutgers, the State University of New Jersey, 1993.